

719Pro

Pressure Calibrator

Calibration Manual

LIMITED WARRANTY AND LIMITATION OF LIABILITY

Each Fluke product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is three years and begins on the date of shipment. Parts, product repairs, and services are warranted for 90 days. This warranty extends only to the original buyer or end-user customer of a Fluke authorized reseller, and does not apply to fuses, disposable batteries, or to any product which, in Fluke's opinion, has been misused, altered, neglected, contaminated, or damaged by accident or abnormal conditions of operation or handling. Fluke warrants that software will operate substantially in accordance with its functional specifications for 90 days and that it has been properly recorded on non-defective media. Fluke does not warrant that software will be error free or operate without interruption.

Fluke authorized resellers shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of Fluke. Warranty support is available only if product is purchased through a Fluke authorized sales outlet or Buyer has paid the applicable international price. Fluke reserves the right to invoice Buyer for importation costs of repair/replacement parts when product purchased in one country is submitted for repair in another country.

Fluke's warranty obligation is limited, at Fluke's option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to a Fluke authorized service center within the warranty period.

To obtain warranty service, contact your nearest Fluke authorized service center to obtain return authorization information, then send the product to that service center, with a description of the difficulty, postage and insurance prepaid (FOB Destination). Fluke assumes no risk for damage in transit. Following warranty repair, the product will be returned to Buyer, transportation prepaid (FOB Destination). If Fluke determines that failure was caused by neglect, misuse, contamination, alteration, accident, or abnormal condition of operation or handling, including overvoltage failures caused by use outside the product's specified rating, or normal wear and tear of mechanical components, Fluke will provide an estimate of repair costs and obtain authorization before commencing the work. Following repair, the product will be returned to the Buyer transportation prepaid and the Buyer will be billed for the repair and return transportation charges (FOB Shipping Point).

THIS WARRANTY IS BUYER'S SOLE AND EXCLUSIVE REMEDY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. FLUKE SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, INCLUDING LOSS OF DATA, ARISING FROM ANY CAUSE OR THEORY.

Since some countries or states do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any provision of this Warranty is held invalid or unenforceable by a court or other decision-maker of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision.

Fluke Corporation
P.O. Box 9090
Everett, WA 98206-9090
U.S.A.

Fluke Europe B.V.
P.O. Box 1186
5602 BD Eindhoven
The Netherlands

Table of Contents

Title	Page
Introduction.....	1
Contact Fluke	1
Safety Information	2
Symbols.....	3
Specifications	4
Maintenance.....	6
Replace the Batteries	6
Clean the Product.....	7
Clean the Valve Assembly.....	7
Required Equipment.....	8
Verification Procedure	9
Pressure Verification	9
DC Voltage Measure Verification	11
DC Current Measure Verification.....	11
RTD Measure Verification	11
720RTD Probe Verification.....	12
mA Loop Performance Check	13
Calibration Adjustment	13
Initiate Communication	13
Adjust Voltage Input	14
Adjust mA Input	15
Calibrate mA Source	15
Adjust RTD	16
Adjust Pressure	17
User-Replaceable Parts and Accessories.....	18

List of Tables

Table	Title	Page
1.	Symbols.....	3
2.	Required Equipment for Verification and Calibration	8
3.	Pressure Verification Tests	10
4.	DC Voltage Measure Verification Tests	11
5.	DC Current Measure Verification Tests.....	11
6.	RTD Measure Verification Tests	12
7.	720RTD Probe Verification Tests.....	12
8.	List of Test Equipment to Calibrate Voltage Input.....	14
9.	List of Test Equipment to Calibrate mA Input.....	15
10.	List of Test Equipment to Calibrate RTD.....	16
11.	List of Test Equipment to Calibrate Pressure Input.....	17
12.	User-Replaceable Parts and Accessories.....	18

List of Figures

Figure	Title	Page
1.	Battery Replacement.....	7
2.	User-Replaceable Parts and Accessories.....	20

Introduction

The 719PRO Pressure Calibrator (the Product) is a simple to use and versatile pressure calibrator. Its internal pressure sensor and innovative electrically-powered pump reach higher pressures (maximum 300 psi) and let the Product calibrate virtually any pressure device. The Product features inputs for mA, voltage, switch contacts, and an RTD probe. An external-pressure module option gives a wider range of pressure calibration options that include absolute and differential.

Contact Fluke

To contact Fluke, call one of the following telephone numbers:

- Technical Support USA: 1-800-44-FLUKE (1-800-443-5853)
- Calibration/Repair USA: 1-888-99-FLUKE (1-888-993-5853)
- Canada: 1-800-36-FLUKE (1-800-363-5853)
- Europe: +31 402-675-200
- Japan: +81-3-6714-3114
- Singapore: +65-6799-5566
- Anywhere in the world: +1-425-446-5500

Or, visit Fluke's website at www.fluke.com.

To register your product, visit <http://register.fluke.com>.

To download manuals, or to view, print, or download the latest manual supplement, visit <http://us.fluke.com/usen/support/manuals>.

Safety Information

A **Warning** identifies conditions and procedures that are dangerous to the user. A **Caution** identifies conditions and procedures that can cause damage to the Product or the equipment under test.

Warning

To prevent possible electrical shock, fire, or personal injury:











- Only assemble and operate high-pressure systems if you know the correct safety procedures. High-pressure liquids and gases are hazardous and the energy from them can be released without warning.
- Read all safety information before you use the Product.
- Carefully read all instructions.
- Do not use the Product around explosive gas or vapor.
- Use the correct terminals, function, and range for measurements.
- Do not apply more than the rated voltage, between the terminals or between each terminal and earth ground.
- Do not touch voltages >30 V ac rms, 42 V ac peak, or 60 V dc.
- Remove all probes, test leads, and accessories before the battery door is opened.
- Do not exceed the Measurement Category (CAT) rating of the lowest rated individual component of a Product, probe, or accessory.
- Do not use and disable the Product if it is damaged.
- Remove the input signals before you clean the Product.
- Use only specified replacement parts.
- Have an approved technician repair the Product.
- Use the Product only as specified, or the protection supplied by the Product can be compromised.
- Pressure sensors can be damaged and/or personnel injury can occur due to improper application of pressure. Vacuum should not be applied to any gauge pressure sensor. The Product display shows “OL” when an inappropriate pressure is applied. If “OL” is shown on any pressure display, the pressure should be reduced or vented immediately to prevent Product damage or possible personnel injury. “OL” is shown when the pressure exceeds 110 % of the nominal range of the sensor or when a vacuum in excess of 2 PSI is applied on gauge range sensors.
- Push the ZERO button to zero the pressure sensor when vented to atmospheric pressure.
- Remove the batteries if the Product is not used for an extended period of time, or if stored in temperatures that exceed the battery manufacturer’s specification. If the batteries are not removed, battery leakage can damage the Product.

- **Replace the batteries when the low battery indicator shows to prevent incorrect measurements.**
- **Be sure that the battery polarity is correct to prevent battery leakage.**
- **Repair the Product before use if the battery leaks.**
- **The battery door must be closed and locked before you operate the Product.**
- **Use only specified replacement parts.**

Symbols

Symbols used on the Product or in this manual are shown in Table 1.

Table 1. Symbols

Symbol	Description	Symbol	Description
	Risk of Danger. Important information. See Manual.		Conforms to relevant North American Safety Standards.
	Hazardous voltage. Risk of electric shock.		Double Insulated
	Conforms to European Union directives.		Conforms to relevant Australian EMC standards.
	Inspected and licensed by TÜV Product Services.		Battery
	This product complies with the WEEE Directive (2002/96/EC) marking requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste. Product Category: With reference to the equipment types in the WEEE Directive Annex I, this product is classed as category 9 "Monitoring and Control Instrumentation" product. Do not dispose of this product as unsorted municipal waste. Go to Fluke's website for recycling information.		Conforms to relevant South Korean EMC Standards.

Specifications

Pressure Measurement	Range	Resolution	Accuracy	Comment
719Pro-30G	-12 to 30 PSI/-0.8 to 2 bar	0.001 PSI 0.0001 bar	±0.025 % of full scale, 6 months ±0.035 % of full scale, 1 year	Dry air and non-corrosive gas only
719Pro-150G	-12 to 150 PSI/-0.8 to 10 bar	0.01 PSI 0.001 bar		
719Pro-300G	-12 to 300 PSI/-0.8 to 20 bar	0.01 PSI 0.001 bar		
Temperature effect (all ranges)			Add ±0.002 % of full scale for temps outside of 15 °C to 35 °C	No effect on accuracy on all functions from 15 °C to 35 °C
Function	Range	Resolution	Accuracy (1 year)	Comment
mA dc (simulation and measurement)	0 mA dc to 24 mA dc	0.001 mA	±0.015 % of reading ±2 counts	1000 Ω maximum load in mA source, 26 V dc maximum voltage in mA simulate
Volts dc (measurement only)	30 V dc	0.001 V		No ac voltage measurement, do not exceed 30 V dc
Temperature (measurement only, Pt100 RTD)	-50 °C to 150 °C (-58 °F to 302 °F)	0.01 °C 0.01 °F	Temperature ±0.1 °C (0.2 °F)	±0.25 °C (±0.45 °F) combined uncertainty when using 720 RTD probe (optional accessory)
Loop power supply	24 V dc	N/A	24 mA at 24 V	
Temperature Effect (all functions)			Add ±0.002 % full scale/°C for temperatures outside of 15 °C to 35 °C	No effect on accuracy on all functions from 15 °C to 35 °C

Temperature Range

Operating -10 °C to +50 °C (14 °F to +122 °F)

Storage

With Batteries Per battery manufacturer's specification, not to exceed storage specification without batteries.

Without Batteries -20 °C to +60 °C (-4 °F to +140 °F)

Altitude 2000 m

Power

Batteries 8 AA batteries (alkaline)

Battery Life 300 pump cycles to 150 PSI minimum; 1000 pump cycles to 30 PSI; 100 pump cycles to 300 PSI minimum

Physical

Dimensions with holster (H x W x D) (24.13 x 11.18 x 7) cm, (9.5 x 4.4 x 2.8) in

Weight with holster 1.2 kg (2.5 lb)

Ingress Protection IP40

Connectors/Ports

Pressure One (1), 1/8 in NPT

Electrical Standard banana jacks

RTD Probe 4-pin miniature circular

External Module 6-pin miniature circular

Engineering Units psi, bar, mbar, kPa, kgcm², cmH₂O @ 4 °C, cmH₂O @ 20 °C, mH₂O @ 4 °C, mH₂O @ 20 °C, inH₂O @ 4 °C, inH₂O @ 20 °C, inH₂O @ 60 °F, mmHg @ 0 °C, inHg @ 0 °C, ftH₂O @ 4 °C, ftH₂O @ 20 °C, ftH₂O @ 60 °F

Electromagnetic Compatibility (EMC)

IEC 61326-1 Electromagnetic Environment: Portable

Korea (KCC) Class A Equipment (Industrial Broadcasting & Communication Equipment)

This product meets requirements for industrial (Class A) electromagnetic wave equipment and the seller or user should take notice of it. This equipment is intended for use in business environments and is not to be used in homes.

Maintenance

Replace the Batteries

If the batteries discharge too far, the Product automatically shuts down to prevent battery leakage.

Note

Use only AA size alkaline, Lithium batteries, or rechargeable NiMH cells.

Warning

To prevent possible electrical shock, fire, or personal injury:

- Remove the batteries if the Product is not used for an extended period of time, or if stored in temperatures that exceed the battery manufacturer's specification. If the batteries are not removed, battery leakage can damage the Product.
- Replace the batteries when the low battery indicator shows to prevent incorrect measurements.
- Be sure that the battery polarity is correct to prevent battery leakage.
- Repair the Product before use if the battery leaks.
- The battery door must be closed and locked before you operate the Product.

To change the batteries, see Figure 1:

1. Turn off the Product.
2. Turn the Product over so that the display is face down.
3. With a flat-head screwdriver, remove the battery door screw.
4. Lift out and disconnect the battery holder.
5. Replace the eight AA batteries with new batteries. Make sure that the polarity on the batteries is correct.
6. Reconnect the battery holder.
7. Reinsert the battery holder into the battery compartment.
8. Replace the battery door.
9. Tighten the battery door screw.

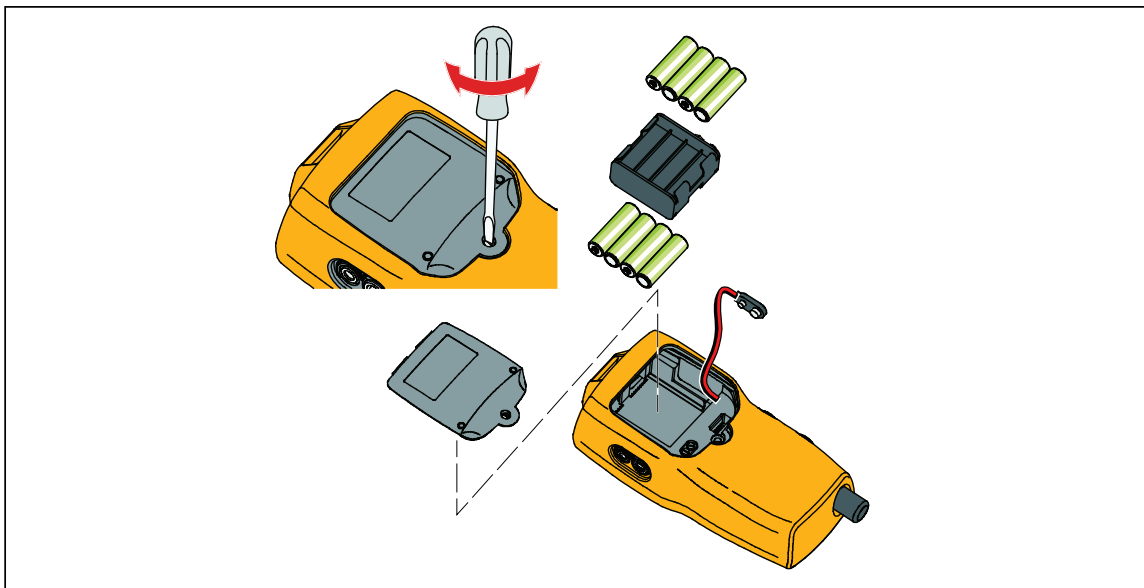


Figure 1. Battery Replacement

hix061.eps

Clean the Product

⚠ Caution

To avoid damaging the plastic lens and case, do not use solvents or abrasive cleansers.

Clean the Product with a soft cloth dampened with water or water and mild soap.

Clean the Valve Assembly

Occasionally, the Product may not work properly due to dirt or other contamination of the internal valve assembly. Use the subsequent procedure to clean the valve assembly. If this procedure does not correct the problem, a repair kit can be ordered. See the “User-Replaceable Parts” section.

1. With a small screwdriver, remove the two valve retention caps located in the battery compartment area (see Figure 1).
2. After the caps have been removed, gently remove the spring and ring assembly.
3. Set aside the valve assemblies in a safe area and clean out the valve body with a cotton swab soaked in IPA (isopropyl alcohol).
4. Repeat the process several times with a new cotton swab each time until there is no evidence of contamination or dirt.
5. Operate the pump handles several times and recheck for contamination.
6. Clean the O-ring assembly and the O-ring on the retention caps with IPA and inspect the O-rings closely for any damage or excessive wear. Replacements are included in the repair kit, if necessary.

7. Inspect the springs for wear or loss of tension. They should be approximately 8.6 mm long in the relaxed state. If shorter, they may not provide sufficient seal tension. Replace if necessary.
8. Once all parts have been cleaned and inspected, reinstall the O-ring and spring assembly into the valve body.
9. Reinstall the retention caps and gently tighten each cap.
10. Seal the output port and operate the pump to at least 50 % of capacity.
11. Release the pressure and repeat several times to ensure that the rings seat properly.

Required Equipment

The equipment listed in Table 2 is necessary to do the performance verification tests and calibration adjustment.

Table 2. Required Equipment for Verification and Calibration

Equipment	Minimum Specifications	Recommended Model
Low thermal EMF banana to banana leads	-	Pomona 2948-36-2 (red) 2948-36-0 (black)
RTD Adapter	-	Fluke 720URTD
Calibrator	0 V to 30 V Accuracy: 0.003 % + 0.5 mV 0 mA to 24 mA Accuracy: 0.006 % + 0.25 mA -40 °C to 150 °C RTD 0.1 °C	Fluke 5522A
DMM	0 to 30 Volts Accuracy: 0.5 V	Fluke 8846A
Pressure Controller/Calibrator	-14 PSI to 300 PSI 0.005 %	Ruska 7250xi
Metrology Well	-30 °C to 140 °C 0.06 °C	Fluke 9170

Verification Procedure

⚠⚠ Warning

To prevent possible electrical shock, fire, or personal injury, do not perform the performance test or verification test procedures unless the Product is fully assembled.

The performance tests verify the complete operation of the Product and measure the accuracy of each function against Product specifications. If the Product fails a part of the test, calibration adjustment or repair is necessary. See “Calibration Adjustment Procedure”.


The performance verification tests check the accuracy of each Product function against its specifications. If the Product fails any of these tests, calibration adjustment or repair is necessary.

Pressure Verification

1. Carefully attach the pressure fitting of the Pressure Controller/Calibrator or Piston Gauge, called pressure source for the remainder of this procedure, to the first pressure port of the Product.

Note

Use a sufficient amount of PTFE tape when attaching pressure fitting.

The display should read 0.00 PSI with the deadweight tester opened up to ambient air. If not, push  until both displays read 0.00 PSI.

2. Set up the deadweight tester for the sequence of PSI inputs from Table 3 to be injected into the pressure port of the Product.
3. Ensure the pressure has stabilized at each input before the display reading is verified.
4. Carefully vent all pressure and disconnect the first pressure port.

Table 3. Pressure Verification Tests

Input Pressure	6 Month Lower Limit	6 Month Upper Limit	12 Month Lower Limit	12 Month Upper Limit
719PRO-30G				
30.000	29.992	30.008	29.989	30.011
25.000	24.992	25.008	24.989	25.011
17.500	17.492	17.508	17.489	17.511
12.000	11.992	12.008	11.989	12.011
5.000	4.992	5.008	4.989	5.011
0.000	-0.008	0.008	-0.011	0.011
-3.000	-3.008	-2.992	-3.011	-2.989
-7.000	-7.008	-6.992	-7.011	-6.989
-12.000	-12.008	-11.992	-12.011	-11.989
719PRO-150G				
150.00	149.96	150.04	149.95	150.05
125.00	124.96	125.04	124.95	125.05
100.00	99.96	100.04	99.95	100.05
50.00	49.96	50.04	49.95	50.05
25.00	24.96	25.04	24.95	25.05
0.00	-0.04	0.04	-0.05	0.05
-3.00	-3.04	-2.96	-3.05	-2.95
-7.00	-7.04	-6.96	-7.05	-6.95
-12.00	-12.04	-11.96	-12.05	-11.95
719PRO-300G				
300.00	299.92	300.08	299.89	300.11
250.00	249.92	250.08	249.89	250.11
175.00	174.92	175.08	174.89	175.11
100.00	99.92	100.08	99.89	100.11
50.00	49.92	50.08	49.89	50.11
0.00	-0.08	0.08	-0.11	0.11
-3.00	-3.08	-2.92	-3.11	-2.89
-7.00	-7.08	-6.92	-7.11	-6.89
-12.00	-12.08	-11.92	-12.11	-11.89

5. Carefully vent all pressure and disconnect the second pressure port.

DC Voltage Measure Verification

1. Push **F2** repeatedly until VOLTS is shown in the third row of the display.
2. Connect the Product red banana jack (V mA) to the 5522A HI VOLTS Output.
3. Connect the Product black banana jack (COM) to the 5522A LO VOLTS Output.
4. Set the 5522A for the voltage setting in Table 4 and verify the display reading on the Product.

Table 4. DC Voltage Measure Verification Tests

Applied Voltage from 5522A	Lower limit	Upper Limit
0.000 V	-0.002 V	0.002 V
15.000 V	14.996 V	15.004 V
30.000 V	29.994 V	30.007 V

5. Set the 5522A to Standby.

DC Current Measure Verification

1. Press **F2** repeatedly until mA is shown in the third row of the display.
2. Connect the Product red banana jack (V mA) to the 5522A HI mA Output.
3. Connect the Product black banana jack (COM) to the 5522A LO mA Output.
4. Set the 5522A for the current setting in Table 5, and verify the display reading on the Product.

Table 5. DC Current Measure Verification Tests

Applied Current from 5522A	Lower limit	Upper Limit
4.000 mA	3.997 mA	4.003 mA
12.000 mA	11.996 mA	12.004 mA
24.000 mA	23.994 mA	24.006 mA

5. Set the 5522A to Standby.

RTD Measure Verification

1. Push **F2** repeatedly until RTD is shown in the third row of the Product display.
2. Connect the 720URTD to the Product.
3. Connect the 720URTD Current HI to the 5522A HI RTD Output.
4. Connect the 720URTD Sense HI to the 5522A HI RTD Output.
5. Connect the 720URTD Current LO to the 5522A LO RTD Output.
6. Connect the 720URTD Sense LO to 5522A LO RTD Output.
7. Set the 5522A to output the resistance setting in Table 6, and verify that the display readings on the Product are within the limits.

Table 6. RTD Measure Verification Tests

Applied Current from 5522A	Lower limit	Upper Limit
84.270 Ω	-40.10 °C	-39.90 °C
100.000 Ω	-0.10 °C	0.10 °C
157.325 Ω	149.90 °C	150.10 °C

8. Set 5522A to standby.

720RTD Probe Verification

Note

This is an optional test if the Product is paired with a 720RTD.

1. Push **F2** repeatedly until RTD is shown in the third row of the Product display.
2. Plug the 720RTD probe into the Product.
3. Insert the probe into the Metrology Well.
4. Set the 9170 to the temperatures in Table 7.
5. After the well stabilizes, verify that the display readings are within tolerance.

Table 7. 720RTD Probe Verification Tests

Applied Temperature	Lower Limit	Upper Limit
-30.00 °C	-30.25 °C	-29.75 °C
0.00 °C	-0.25 °C	0.25 °C
70.00 °C	69.75 °C	70.25 °C
130.00 °C	129.75 °C	130.25 °C

6. Set 9170 to standby.

mA Loop Performance Check

Loop voltage does not have traceable specifications, this is a functional check only.

1. Push **F2** to get LOWER in the display above **F2**.
2. Push **F1** to show CONFIG and then push again to show SELECT on the display.
Type of measurement should be flashing in the lower display.
3. Push **F1** until mA flashes.
4. Push **F2**.
5. The type of measurement/source flashes. Push **F1** until MEAS/24V flashes.
6. Push **F3** to begin supplying loop power.
7. Connect the Product red banana jack (V mA) to the 8846A HI Input.
8. Connect the Product black banana jack (COM) to the 8846A LO Input.
9. Set the 8846A to dc volts range. The voltage measured should be between 22 V and 30 V.
10. When a Product fails any verification step, adjustment or repair is recommended by Fluke.

Calibration Adjustment

The Product has an electronic calibration process. There are no mechanical adjustments and the calibration is done with the case closed. A serial communications port is used for the calibration process to send commands and receive readings. The normal RS232 interface is used. Calibration can be done with a terminal program or an automated-calibration program can be written with programs like MetCal. In this manual, only the serial terminal mode is described.

Table 2 lists the required equipment.

Initiate Communication

Terminal communications can be set up with terminal communication software on a PC such as HyperTerminal or Ucon. Connect the RS232 cable to the 5-pin Lemo on the side of the Product. The other end of the cable connects to the terminal/PC serial port.

Terminal Settings:

- Bits per second: 9600
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: none
- Local echo: on

All calibration commands are performed on the functions selected on the lower display. Use this command sequence to turn off all but the lower display:

DISPLAY UPPER, OFF DISPLAY MIDDLE, OFF DISPLAY LOWER, ON

As long as the Product has been at a stable temperature, within the range of 20 °C to 26 °C for an hour or more, the Product only needs 5 minutes to warm up. If temperature conditions were previously <10 °C or >40 °C, then the Product must be allowed to stabilize for a minimum of 3 hours prior to calibration.

Adjust Voltage Input

The test equipment to adjust the voltage input is listed in Table 8.

Table 8. List of Test Equipment to Calibrate Voltage Input

Quantity	Manufacturer	Model	Equipment
1	Pomona	2948-36-2 (red) 2948-36-0 (black)	Low-thermal EMF banana to banana leads
1	Fluke	5522A	Calibrator

1. Use the test lead set to attach the voltage output of the 5522A to the input of the product.
2. Send this command to put the Product into Voltage mode:
FUNC LOWER,DCV
3. Use the 5522A to input 0 V.
4. When the reading is stable, send the command:
CAL_POINT[0][0]
5. Use the 5522A to input 15 V.
6. When the reading is stable, send the command:
CAL_POINT[0][1]
7. Use the 5522A to input 30 V.
8. When the reading is stable, send the command:
CAL_POINT[0][2]

The voltage range is now calibrated.

Adjust mA Input

The test equipment to adjust the mA input is listed in Table 9.

Table 9. List of Test Equipment to Calibrate mA Input

Quantity	Manufacturer	Model	Equipment
1	Pomona	2948-36-2 (red) 2948-36-0 (black)	Low-thermal EMF banana to banana leads
1	Fluke	5522A	Calibrator

1. Use the test lead set to attach the voltage output of the 5522A to the input of the Product.
2. Send this command to put the Product into Current mode:
 FUNC LOWER,DCI
3. Use the 5522A to input 0 mA.
4. When the reading is stable, send the command:
 CAL_POINT[0][0]
5. Use the 5520A to input 12 mA.
6. When the reading is stable, send the command:
 CAL_POINT[0][1]
7. Use the 5520A to input 24 mA.
8. When the reading is stable, send the command:
 CAL_POINT[0][2]
9. The milliamp measure range is now calibrated. Use the 5522A to verify the calibration.

Calibrate mA Source

1. Place a short from V/mA to the COM input of the Product.
2. Send this command to put the Product into Current Source mode:
 FUNC LOWER,DCI
 IO_STATE SOURCE
3. Once the Product is in the Current Source mode, send the command:
 CAL_MA_SRC
4. The Product will then internally calibrate mA source based on the 5522A mA read calibration.
 The milliamp source range is now calibrated.

Adjust RTD

The test equipment to adjust RTD is listed in Table 10.

Table 10. List of Test Equipment to Calibrate RTD

Quantity	Manufacturer	Model	Equipment
4	Pomona	2948-36-2 (red) 2948-36-0 (black)	Low-thermal EMF banana to banana leads
1	Fluke	720URTDA	RTD Adapter
1	Fluke	5522A	Resistance Standard (w/ a 4:1 TUR)

1. Connect the Product to the Resistance Standard:
 - a) Plug the 720URTDA into the Product.
 - b) Connect the HI side of the current output (ohms measure) jacks of the 720URTDA to the NORMAL HI of the 5522A.
 - c) Connect the LO side of the current output (ohms measure) of the 720URTDA to the NORMAL LO of the 5522A.
 - d) Connect the HI side of sense jacks of the 720URTDA to the AUX HI of the 5522A.
 - e) Connect the LO side of the sense jacks of the 720URTDA sense input to the AUX LO of the 5522A.
 - f) Set the 5522A to 4 WIRE COMP.
2. After you have made the connections, send this command to put the Product into RTD mode:


```
FUNC LOWER,RTD
```
3. Use the Resistance Standard to input 90 Ω .
4. When the reading is stable send the command:


```
CAL_POINT[0][0]
```
5. Use the Resistance Standard to input 140 Ω .
6. When the reading is stable, send the command:


```
CAL_POINT[0][1]
```

The RTD range is now calibrated.

Adjust Pressure

The test equipment to adjust RTD is listed in Table 11.

Table 11. List of Test Equipment to Calibrate Pressure Input

Quantity	Manufacturer	Model	Equipment
1	Ruska	Ruska 7250xi	Pressure Controller/Calibrator

Note

The Product uses a 1/8" NPT female connection in the pressure input port. Various adapters may be needed to connect to the pressure standard. Always make sure the hose, tubing, and fittings have a rated working pressure at or above the pressure of the Product. Also it is important that there be no leaks. To achieve accurate calibration, use PTFE tape where appropriate.

1. Once connected, send this command to put the unit in pressure mode:
 FUNC LOWER,P1
 2. Send the command:
 OFFSET_ADJ?
 3. Note the value returned.
 4. Use the pressure standard to input a value equal or close to the noted value.
 5. When the pressure is stable, send the command:
 OFFSET_ADJ n
 where n is the entered pressure.
 6. Send the command:
 GAIN_ADJ? command.
 7. Note the value returned.
 8. Use the pressure standard to input a value equal or close to the noted value.
 9. When the pressure is stable send the command:
 GAIN_ADJ n
 where n is the applied pressure.
- Pressure has now been adjusted.

User-Replaceable Parts and Accessories

⚠⚠ Warning

To prevent possible electrical shock, fire, or personal injury, use only specified replacement parts.

User-replaceable parts are listed in Table 12 and shown in Figure 2. For more information about these items, contact a Fluke representative. See the “Contact Fluke” section of this manual.

Table 12. User-Replaceable Parts and Accessories

Item	Description	Part Number
①	Holster	4497314
②	Keypad	4364770
③	Lens, 30 PSIG	4365524
	Lens, 150 PSIG	4365536
	Lens, 300 PSIG	4365549
④	Fluke-7XX-2020 Display Module	4399149
⑤	Selector Knob	4380627
⑥	719Pro Vernier Adjustment Knob	664190
⑦	Port Label, 30 PSI, 2 BAR	4110698
	Port Label, 150 PSI, 10 BAR	4374295
	Port Label, 300 PSI, 20 BAR	4110710
⑧	TPAK80-4-2002 Magnet Strip	669952
⑨	TPAK80-4-8001 Strap, 9 in.	669960
⑩	Safety Sheet	4354604
⑪	Quick Reference Guide	4354567
⑫	User Manuals CD	4354598
⑬	AA, Alkaline Batteries	376756
⑭	Bottom Plug, PRO 30, 150PSIG	4365560
⑮	Fluke-719Pro, Battery Door	4364820
⑯	Fluke-719Pro, Beltline Gasket, Black	4364835
⑰	Fluke-719Pro, 30P,REPLACEMENT CASE TOP ASSEMBLY	4443706
	FLUKE 719PRO, 150P,REPLACEMENT CASE TOP ASSEMBLY	4443714
	FLUKE 719PRO, 300P,REPLACEMENT CASE TOP ASSEMBLY	4443723
⑱	71X-TRAP, Liquid Dirt Trap	4380747
⑲	RTD Probe	4366669
⑳	Fluke-719Pro, Decal, Battery Door	4364762
Not Shown	Fluke-719Pro, Case Bottom Pro 300 Psig	4443691
Not Shown	Fluke-719Pro, Case Bottom Pro 30, 150 Psig	4443678

Table 12. User-Replaceable Parts and Accessories (cont.)

Item	Description	Part Number
Not Shown	Pump assembly, 30 Psig and 150 Psig	4450976
Not Shown	Pump assembly, 300 Psig	4451006
Not Shown	Test Lead Set	Variable ^[1]
Not Shown	Alligator Clip, Red	Variable ^[1]
Not Shown	Alligator Clip, Black	Variable ^[1]
Not Shown	URTD, Universal RTD Adapter (RTD Breakout Box) for 719Pro and 721.	4382695
Not Shown	Kit-hose, fittings (3), adapters (2)	3345825
Not Shown	FLK719PRO 300PRK, Pump Rebuild Kit, 719PRO-300G	4451006
Not Shown	FLK719PRO 30 150PR, Pump Rebuild Kit, 719PRO-30 AND 150G	4401179
Not Shown	FLUKE-7XX Cable,USB, 5 Pin LEMO, SGL 6ft	4401616
<p>[1] See www.fluke.com for more information about the test leads and alligator clips available for your region.</p>		

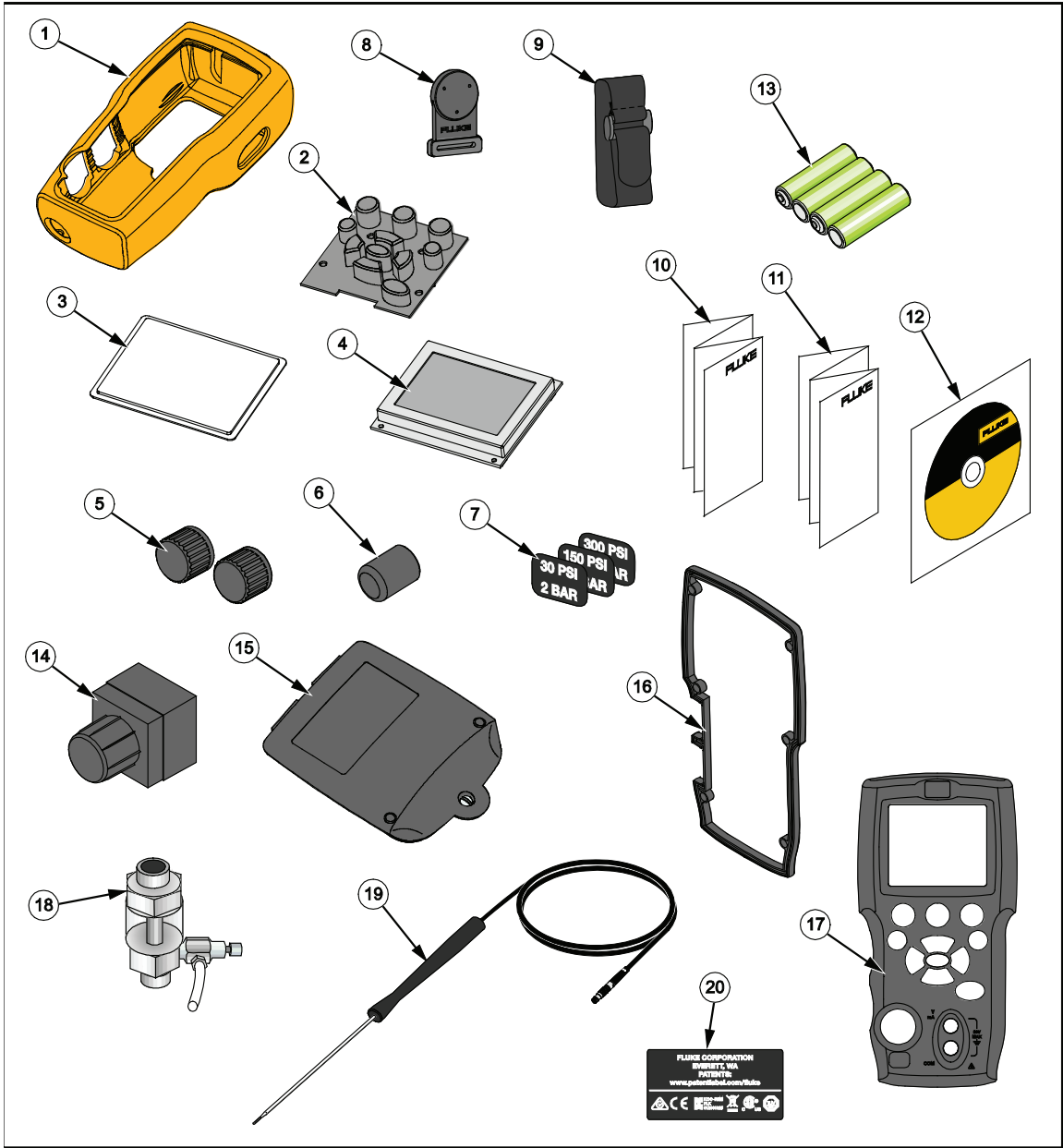


Figure 2. User-Replaceable Parts and Accessories

hix063.eps